



LESSONS LEARNED

CLIPPED WINGS: THE DEATH OF JACK NORTHROP'S FLYING WING BOMBERS

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One of the mysteries in defense acquisition has concerned the fate of the Northrop Flying Wing bombers, canceled by the Air Force more than 50 years ago. Aviation experts have long suspected that the 1949 cancellations were motivated more by politics than by the Wings' technical shortcomings. However, public records, declassified Air Force documents, and personal interviews — never before published — reveals that the cancellation of the Flying Wings was a sound decision, based on budgetary, technical, and strategic realities; and the issues addressed here are as pertinent to defense acquisition today as they were 50 years ago. Like today, decision makers struggled to balance cost, schedule, and technical performance. They also had to deal with shrinking defense budgets, a declining defense industrial base, and a world situation in which the only constant was change. Nearly all the interviewees for this research — including Secretary (and Senator) Symington, Generals LeMay, Norstad, and Quesada — are gone now, but their recollections here serve to make clear what really happened to the predecessors of today's B-2 bomber. The lessons of the Flying Wings remain pertinent today.

More than 50 years ago, a series of remarkable aircraft took to the skies of America. These huge all-wing bombers were the product of the genius John Knudsen Northrop, and they promised to revolutionize the aviation world. But just a few short years later all of the giant bombers were gone, leaving only photos and videos to mark their passing. Ever since their demise, rumors and accusations have swirled around their memory: Were the Northrop wings victims

of their own technical shortcomings? Or were they pawns in a high-stakes political power play, as Jack Northrop contended? This article will answer those questions.

For decades, doubts and rumors about the demise of the Flying Wings went unresolved. A congressional investigation in 1949 seemed to absolve the Air Force of blame, and Mr. Northrop himself testified then that he had received no political pressure from Air Force leadership concerning



his Flying Wings. But all that changed in 1979, when Mr. Northrop claimed that he had in fact been improperly pressured by the Secretary of the Air Force, and that his resistance to that pressure was the true cause of the Wings' cancellation.

The research for this paper made use of declassified government documents and other historical records. Far more important, though, were the author's lengthy interviews with most of the major government decision makers, including former Secretary of the Air Force (later Senator) W. Stuart Symington, General Curtis E. LeMay, General Lauris Norstad, and other retired Air Force leaders. Two retired Air Force Flying Wing pilots, Brigadier General Robert Cardenas and Colonel Russ Schlee, contributed their perspectives. Thomas Jones, longtime chairman of the Northrop Corporation, provided his opinions, based on his knowledge of the parties involved.

The interviews contained in this article were done nearly 20 years ago as part of the author's doctoral dissertation. These conversations have never before been published: Shortly after this research was completed, the author was assigned to the "black world" environment of what was then called the Advanced Technology Bomber (ATB). The very fact that the ATB (today the B-2 Stealth Bomber) was itself a successor to Jack Northrop's Flying Wings was then a closely guarded secret, so public acknowledgment of any connection between the ATB program and Northrop's Flying Wings remained off-limits through most of the 1980s.

The similarities between the Flying Wings of the 1940s and today's B-2 bomber go far deeper than attributes such as shared dimensions, appearance, and

flight control configurations. Much of the programmatic difficulty described in these pages was repeated, 40 years afterward, with the B-2. The capacity limitations of the 1940s described here still limited Northrop's ability to produce large numbers of bomber aircraft four decades later. This and other issues caused major delays for both the Flying Wings and the modern B-2, so that both programs came to fruition in geopolitical worlds vastly different from those in which they were conceived.

The events described in this paper took place more than 50 years ago, but they resonate clearly in today's acquisition environment. Perennial issues of cost, schedule, and technical performance are of course as pertinent today as they were then. But so too are other issues: preservation of the industrial base in a time of severe defense downsizing; programmatic turbulence caused by changes in defense leadership; and the role of government in encouraging (or discouraging) business consolidation among defense contractors.

This story embodies those issues and more: accusations and counteraccusations, congressional hearings and investigations, and momentous decisions that quite literally changed the shape of American aviation.

THE CHARGE

In October of 1979, reporter Clete Roberts of Public Broadcasting System (PBS) station KCET-TV conducted an extraordinary interview with Jack Northrop, founder and former president of what was then the Northrop Corporation. In the filmed interview, it is clear that Mr.



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Northrop was not in good health: His appearance was frail, his eyes watery, and his voice broken. But his mind appeared sharp, and his memory seemed crystal clear. Led by Clete Roberts, Mr. Northrop told his story, clearly and forcefully, for what, he said, was the first time:

The same day that General McNarney[,] who was the chief — the military chief — of the Air Forces, came to my office with that additional order for thirty-five airplanes, which he said was a drop in the bucket as far as the ultimate order was concerned, Mr. Millar and I were requested to visit Mr. Symington. At that meeting, he...told us that he did not want to sponsor any new aircraft companies entering the business and having to be supplied with business over the years, and that he wanted us without question to merge with Consolidated Vultee, which was then operating a government-owned plant in Fort Worth, building the B-36, as a competitor to the B-35 or B-49 [Northrop's Flying Wing bombers].

After the lengthy diatribe on Mr. Symington's part, I said, "Mr. Secretary, what are the alternatives to this demand you're making of our merger with Consolidated Vultee?" He said, "Alternatives? You'll be goddamned sorry if you don't!"

General McNarney said, "Oh, Mr. Secretary, you don't mean

that the way it sounds," and Mr. Symington said, "You're damned right I do!"

Well, this was a rather staggering termination of the meeting. (KCET-TV, 1980)

Interviewed for the same broadcast, Richard W. Millar, who in 1948 was the Northrop chairman of the board, corroborated Mr. Northrop's story.

We were in effect directed to negotiate or work out a merger with Northrop and Convair. Jack Northrop asked the question, "What if we don't merge?" and Mr. Symington was quick to reply that we'd "be damned sorry if we didn't." We were told to get together with Mr. Odlum to work out a basis for the merger. I might say parenthetically that when Mr. Symington said in effect that we must do it, and we'd be sorry if we didn't, General McNarney spoke up and he said, as I recall, "Mr. Symington, you don't mean that, do you?" and Mr. Symington said in effect that, "Yes, you're damned right I do." (KCET-TV, 1980)

The proposed merger never came about. According to Mr. Northrop and Mr. Millar, they visited Floyd Odlum, then president of Convair's parent company, but could reach no agreement on terms of a merger. According to Mr. Northrop, it was shortly after the merger talks broke off that he received a telephone call from Secretary of the Air Force W. Stuart Symington:



I got a telephone call a few days later from Mr. Symington. He said, "I am canceling all your Flying Wing aircraft." And I said, "Oh, Mr. Secretary, why?" And he said, "I've had an adverse report," and hung up. That was the last time I ever talked to him, and the last time we could ever reach him by phone or any other way. (KCET-TV, 1980)

Mr. Northrop went on to claim that the money that was to be used to purchase the Flying Wing bombers then went instead to Convair and was used to purchase more copies of the rival B-36.

MR. ROBERTS: Did he give the contract to someone else?

MR. NORTHROP: He continued the construction of the B-36 by Consolidated Vultee in Fort Worth.

MR. ROBERTS: So, in fact, the contract was taken from you, and given to Consolidated because you had refused to merge with Consolidated, as you were ordered to do by the government, is that accurate?

MR. NORTHROP: That is absolutely accurate. (KCET-TV, 1980)

THE QUESTIONS

Were Mr. Northrop and Mr. Millar correct? Considering the strong similarities

between the original Flying Wing bombers and today's B-2 bomber, is it possible that American aviation development was set back for decades by a corrupt political decision? Were the Flying Wing bombers canceled because of political chicanery, or were there instead legitimate concerns that prompted the cancellation? Before answering those questions, it is necessary to briefly examine the complex history of Northrop's Flying Wing programs.

JACK NORTHROP AND HIS FLYING WINGS

The Northrop Flying Wing bombers did not suddenly burst forth, fully developed, in the late 1940s. Rather, they were the culmination of years of effort by Jack Northrop, arguably the most talented and innovative aircraft design genius of his time. Mr. Northrop had long sought design solutions that would minimize drag while maximizing lift. It was clear to him that an all-wing aircraft, if one could be successfully designed, would be the ultimate in aerodynamic efficiency.

His first "flying wing" — called X216H — was a compromise design, half conventional, half revolutionary. It flew in 1929, and he refined the concept over the next decade. Northrop's N-1M — now on display at the National Air and Space Museum — was his first *all-wing* aircraft: It first flew in 1940, and proved that all-wing aircraft could maintain stable and controlled flight. So Mr. Northrop turned his attention to larger aircraft. On May 21, 1941, he wrote a confidential letter to the Army Air Corps:

[W]e have made very successful and encouraging flights of the



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flying mockup (N-1M) and I believe the time is here when we can seriously consider building bomber aircraft to this design. (Northrop, 1941)

With World War II raging in Europe, the need for such long-range bombers was intense. Just 6 days later, the U.S. Army Air Corps tasked Northrop to perform a design study for just such a bomber, with a desired range of 6,000 miles, a top speed of 450 miles per hour, and a ceiling of 45,000 feet. Within months, a contract was signed: Northrop would produce one Flying Wing bomber (called the XB-35) for \$2,910,000. Delivery would be in 24

months (Contract No. W535-AC-21920, 1941).

Almost immediately, problems arose. Space was so limited at Northrop's Hawthorne plant that there could be no assembly line. In fact, there was not even room to assemble a single XB-35, unless Northrop built a new structure for that purpose. Even that proposed building could handle only one bomber at a time; assembly of subsequent aircraft could not begin until the previous one was complete, unless outdoor production lines were used (Northrop, 1941). This proved to be a crucial problem, and lack of production space would eventually prove to be one factor contributing to the Flying Wing's demise.

Photo courtesy of Northrop Grumman Corporation



What he lacked in formal education Jack Northrop made up for with brilliance and creativity. The Flying Wing bombers were the realization of his quest for aerodynamic efficiency.



Photo courtesy of Northrop Grumman Corporation



The complex system of huge counter-rotating propellers never worked satisfactorily, and doomed the XB-35s to failure.

The XB-35 program turned into a debacle. Under the pressure of wartime demands, Northrop proved incapable of delivering as promised. Despite borrowing talent and facilities whenever possible — at one point 350 draftsmen were on loan from Otis Elevator Company — the program fell further and further behind schedule (Carroll, 1944). Air Materiel Command grew so frustrated with delays, and Northrop's lack of capacity, that production of the B-35 was, for a time, taken from Northrop and shifted to the Glenn Martin Company, which did have the necessary production capacity in Baltimore (Hanley, 1942).

World War II was long over when the XB-35 finally made its maiden flight on June 25, 1946, three years late and about

400 percent over budget (Air Materiel Command, 1947). Its flight test program was racked by difficulties, most related to the complex propulsion system of pushing, counter-rotating propellers. Northrop test pilot Max Stanley summed up the troubles in a 1980 speech:

It was plagued with problems from the very beginning...propellers which would fail to govern, or fail to feather, and if they did feather they would fail to unfeather. The driveshaft would develop unacceptable vibration. The gearbox would overheat. Each of these malfunctions resulted in program delays, some of which were extensive. (Stanley, 1980)



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By 1948, the seemingly endless problems suffered by the two XB-35s were fast causing Air Force interest to wane. On August 16, 1948, Air Force and Northrop representatives discussed what to do with the 11 YB-35s then in production. None had yet flown, and Northrop wanted at least 25 million dollars to store the planes until a propulsion solution could be found. After a series of letters and negotiations, the Air Force told Northrop that “the well was dry,” as far as any more money for the over-cost YB-35s. They would either be scrapped or stored at Northrop’s expense (Director of Procurement and Industrial Planning, 1948). Northrop was unable to underwrite that expense, and the B-35s were disassembled at the Hawthorne plant. The future of Jack

Northrop’s Flying Wing would have to rest with the jet-powered YB-49.

THE BEST HOPE: THE JET-POWERED YB-49

As jet engine technology developed at the close of World War II, the Air Force decided to experiment with a jet-powered Flying Wing bomber. To minimize development time, two of the B-35s then under construction were converted to an eight-jet configuration and redesignated as YB-49s (U.S. Army Air Corps, 1945).

The YB-49s were almost identical to the XB-35s, except in the propulsion systems, where eight jets replaced the four R-4360 engines and their balky propellers. Vertical fences and fins were added for stability, replacing the engine/propeller shaft housings, and two bomb bays

Photo courtesy of Northrop Grumman Corporation



Two XB-35 airframes were modified, to become the eight-jet YB-49. First flight was October 21, 1947. Both YB-49s were eventually lost in accidents.



were converted to fuel tanks to feed the thirsty jet engines.

The result was a sleek and esthetically beautiful aircraft, promising greater speed and maneuverability but at a high price: The range of the jet-powered wing was expected to drop from 4,175 miles to about 3,500 (Hodge & Feicht, 1946). Considering that the original specifications had called for a desired range of 6,000 miles, this was a major disappointment to the Air Force. And range was just part of the problem: The YB-49's small bomb bays, designed in the early 1940s, could accommodate only the smallest conventional bombs. Larger bombs required leaving bomb bay doors partially open in flight, and standard 12,000 and 22,000 pound weapons did not fit at all. Like the XB-35, the YB-49 could not accommodate the atomic bomb (Air Materiel Command, 1947).²

Furthermore, newer and better aircraft were on the way, including Boeing's B-47 and others. Members of the Air Staff doubted that the YB-49 was worth saving:

If procurement was initiated for the B-49, it would not reach tactical units before other bombers of the same class having equal performance and with provisions for carrying the A-bomb. Therefore it is felt that unless the B-49 can be modified to carry the atom bomb, further procurement is unwarranted. (Powers, 1946)

Air Materiel Command was well aware of the shortcomings:

Although the YB-49 has obvious limitations, primarily due to the

fact that it is a modification, it is considered that the airplane will be extremely valuable as a research project. (Hodge & Feicht, 1946)

The first of the two YB-49s made its maiden flight on October 21, 1947 ("Jet wing flies," 1947). The subsequent flight test program was vastly more successful than the XB-35's, but it revealed a crucial problem: The aircraft's instability in pitch and yaw made it impossible for it to bomb accurately. A stability augmentation system eliminated some of the yaw problems, but none of the pitch problems. The result was that bomb runs by experienced bombardiers took four times as long as in the B-29, and average miss distances of 3,000 feet were twice those of other bombers (Williams, 1948).

But the PBS documentary quoted Northrop test pilot Max Stanley as saying that the Air Force had declared the YB-49 "an acceptable bombing platform." Not so, according to Colonel Russ Schlee, the Air Force test pilot who flew the bombing tests:

I flew the airplane eleven times, evaluating the aircraft as a bombing platform both with and without the autopilot. The bombing results were very poor.... I never said it was acceptable, and none of us who flew bombers and knew bombing ever said it was an acceptable bombing platform. (R. E. Schlee, personal communication, July 20, 1983; R. E. Schlee, personal communication, to E. T. Wooldridge, National Air and Space Museum, November 24, 1982.)



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Still the flight test program continued, until June 5, 1948. The second YB-49 had flown only about 66 total hours when Major Daniel Forbes, Captain Glen Edwards, and crew took off to perform a series of stall tests. A memo found in the records of the subsequent investigation indicated that at least one of the test pilots had concerns about the stall performance of the YB-49: "It is known that the pilot was reluctant to attempt the higher power stalls" (Collins, no date).³

Evidently the concern was well-founded: the aircraft disintegrated that morning, high over the Mojave Desert, and all five crew members died.

Surprisingly, the crash did not kill the YB-49 program. The surviving YB-49 was grounded for a time, but then resumed flying. On March 15, 1950, it was destroyed in a high-speed taxi test (*History*, 1950, p. 103). The pilot that day, then-Major Russ Schleeh, had been the first on the scene of the Forbes/Edwards crash in 1948. He was luckier than they were: Badly injured in his own crash, he survived and became an important source for this article.

A RECONNAISSANCE VERSION: THE YRB-49

At the start of this paper, we saw Mr. Northrop's claim that he had received a

Photo courtesy of Northrop Grumman Corporation



Northrop had never before built such large aircraft, and lacked the facilities to do so. Most assembly had to take place outdoors.



firm order for 35 bombers. Yet, this research shows that the Air Force was highly critical of the YB-49's bombing performance, and, indeed, that the aircraft could not even carry the most important bombs in the American arsenal. So, which view is correct?

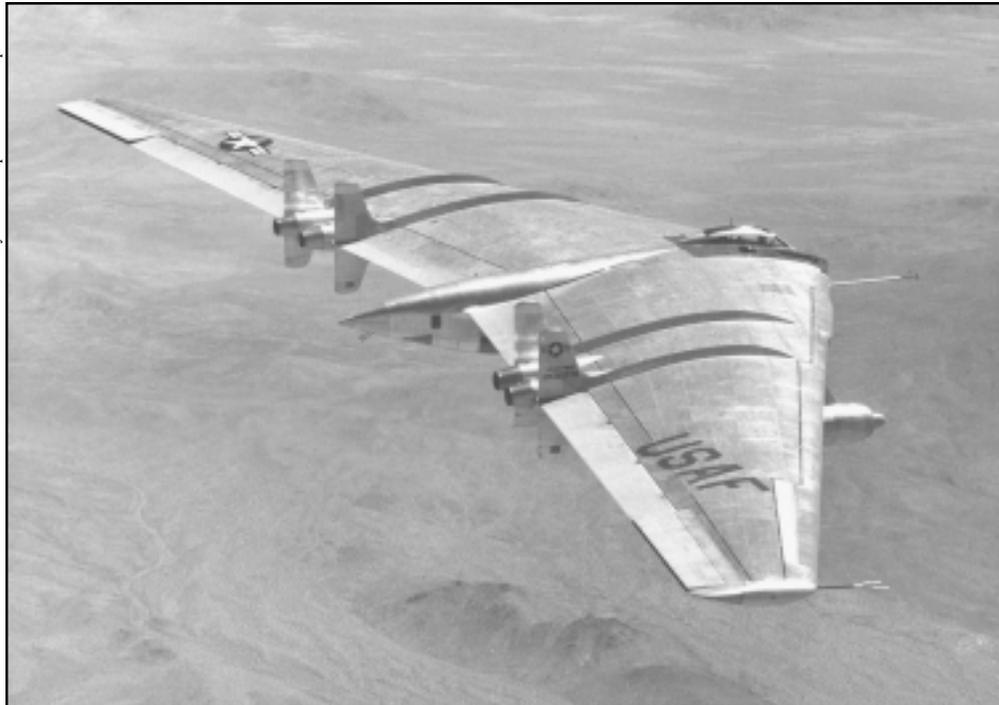
The answer is both...sort of. Mr. Northrop did receive an order, not for 35 aircraft, but for 30. However, the order was not for bombers, but instead for a long-range reconnaissance variant, called the YRB-49.

If the YB-49 had suffered by being a modification, as Materiel Command suggested, then the YRB-49 was doubly damned by being a modification of a modification. One look at the aircraft

reveals the compromises: Four of the internally mounted jet engines were removed to make way for fuel tanks, whereas two jets hung awkwardly in single pods from beneath the wing, sullyng Jack Northrop's dream of an aerodynamically pure all-wing aircraft.

It was this aircraft the Air Force ordered in 1948, to be delivered on a three-aircraft-per-month schedule. At this point, the long-term issue of Northrop's lack of production capacity arose again. Northrop had never been able to produce anything close to three large planes per month (Air Materiel Command, 1948). When the Soviet blockade of Berlin increased world tensions, the Air Force felt it would need even higher-rate production, and the Air

Photo courtesy of Northrop Grumman Corporation



A hybrid design, the YRB-49 saw four of its in-wing engines replaced with fuel tanks. Two engines were added beneath the wing in pods. The Air Force ordered 30, then canceled them.



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Force began to look at other plants to build the Northrop design. This was not a secret and was in fact reported in the industry magazine, *Aviation Week*.

Northrop's productive capacity of only three bombers per month at its Hawthorne, California facilities cannot meet the acceleration of the program desired by the Air Force. ("Air Force," 1948)

At the same time, the huge Air Force plant in Fort Worth was about to be vacated, as the production of Convair's giant B-36 was expected to soon end. The Air Force had been unhappy with the B-36, seeing it as too unreliable and too slow. The B-36 production was expected to end at the 95th aircraft (McNarney, 1948). At the direction of the Air Force Chief of Staff, Air Materiel Commander General McNarney wrote to Northrop and Convair:

Since it is not intended to buy more than the ninety-five B-36 airplanes presently on contract, it is desired that the production of RB-49s be moved to [Fort Worth] at the earliest possible date....It is requested that representatives of Northrop Aircraft and Consolidated Vultee Aircraft arrange the necessary plans. (McNarney, 1948)

General McNarney's letter stands today as a model of bureaucratic miscommunication. What did he mean? Was Northrop supposed to just turn over its most promising design to its competitor? Or was Convair just expected to relinquish

the massive Fort Worth operation, along with its thousands of employees, to Northrop? The record makes clear that the two contractors had these questions and more. They met, as requested, but could not agree on a fair arrangement. Finally, on July 16, 1948, Air Force Secretary Symington met with the heads of both firms in Los Angeles.

"General McNarney's letter stands today as a model of bureaucratic miscommunication. What did he mean?"

This was almost certainly the meeting at which, according to Mr. Northrop, Secretary Symington raised the issue of a merger. The parties agreed on a solution: All but one of the RB-49s would be built by Convair, in Fort Worth. In return, Northrop would receive two-thirds of the profit on the \$84,000,000 contract. Convair would receive a third of the profit, while — and this was far more important — keeping open the Fort Worth factories (*Testimony*, 1949a, p. 68).

So, as the summer of 1948 waned, the situation looked like this: Thirty RB-49s were on order, with at least the possibility of a great many more to follow. Convair would keep its workforce and government-owned plant operating in Fort Worth; Northrop would gain two-thirds of the profit involved, while keeping its own small production capacity alive; and the Air Force would be able to get more aircraft faster, especially if the contemplated boost in orders took place. The deal seemed to give none of the parties everything they wanted, but reasonably addressed the conflicting needs of Northrop, Convair, and the Air Force.



CANCELLATION

In the fall of 1948, though, three separate events spelled the end of the Flying Wing bombers. The RB-49 order might have survived any one, or even two, of these events, but the coincidence of all three proved insurmountable.

RESURGENCE OF THE B-36

Convair's B-36 had proven to be a major disappointment to the Air Force. In 1946, General George C. Kenney, the first commander of the Strategic Air Command (SAC), had recommended that the program be halted: The six-propeller B-36 was just too heavy, too slow, and too vulnerable to attack (*Testimony*, 1949a, p. 47).

But by 1948 the B-36 had improved tremendously, and its greatest improvements were in areas that mattered most: payload, altitude, and range. Where the YB-49 struggled with its undersized payload, the B-36 in one test dropped

" In the fall of 1948, though, three separate events spelled the end of the Flying Wing bombers."

84,000 pounds of bombs — an amount greater than the entire empty gross weight of its Northrop competitor (*Testimony*, 1949a,

p. 71). In that same year, another B-36 climbed to an altitude of 46,000 feet, addressing at least part of the Air Force's concerns about its vulnerability (*Testimony*, 1949a, p. 71).

Similar progress was made in range. When General Kenney recommended scrapping the B-36 in 1946, the best estimate of its range was about 6,500 miles. But by late 1948, B-36s were flying

simulated bombing missions of greater than 8,000 miles (*Testimony*, 1949a, p. 71), making the B-36 the only aircraft capable of round-trip strikes on Eurasian targets from American bases, without reliance on foreign locations or the primitive air refueling technology of the day.

The last major concern the Air Force had about the B-36 was speed, and even that was addressed in late 1948. Convair proposed to add four jets to the six pusher propellers of the huge bomber, increasing top speed by almost 100 miles per hour (*Testimony*, 1949a, p. 74).

GENERAL LEMAY

In October 1948, as the B-36 was improving dramatically, a new commander took over SAC. General Curtis E. LeMay directed a thorough review of SAC's needs for long-range reconnaissance aircraft. The review board assembled in November 1948 and issued their recommendations: The newly improved B-36 was their first choice, followed by two Boeing designs, the B-47 and B-54. The RB-49 was omitted entirely. Major General F. H. Smith explained why, in 1949 congressional testimony:

Between the summer of 1948 and the reconnaissance meeting in November, a number of developments occurred which made the B-49 look less promising in comparison with other airplanes. For one thing, the Air Staff felt less confident about the early availability of the B-49 as a bomber. Its aerodynamic design as a tailless airplane caused it to yaw and pitch.



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It had other shortcomings.... Minor problems of this sort are usual in a radically new design and undoubtedly could be overcome in time, but they were sufficient to...recommend postponing development. (*Testimony*, 1949a, p. 75)

THE THIRD STRIKE: BUDGETARY LIMITS

In 1947, Air Force strength had stood at 48 combat groups. By late 1948 that number had grown to 59, with an ultimate goal of 70 combat units. The RB-49 contract had been geared toward supporting that 70-group force (*Testimony*, 1949a, p. 79–82).

But President Truman refused to support the Joint Chiefs of Staff budget proposal for fiscal year 1950. The services had asked for \$23.8 billion, and that was pared down by Secretary of Defense Forrestal to \$16.9 billion. President Truman, though, set a ceiling of \$14.4 billion (Millis, 1951, pp. 498, 503, 536), as part of his “pay as you go” budget approach:

As county judge, senator, and President, I consistently kept in mind the same sort of tax philosophy. It was a pay-as-you-go program, except in emergency conditions.... There is nothing sacred about the pay-as-you-go idea as far as I am concerned, except that it represents the soundest principle of financing that I know. (Truman, 1956, p. 41)

“Pay as you go” meant one thing for the Air Force: there would be no growth to 70 combat groups as planned, nor could

even the current 59 groups be sustained. The Air Force would have to retrench, cutting all the way back to 48 groups (Millis, 1951, p. 538; *Testimony*, 1949a, p. 83). To recommend exactly where adjustments should be made, a group of four senior Air Force generals was convened in December 1948. It was called the Senior Officers Board.

THE FINAL BLOWS

The first meeting of the Senior Officers Board began on December 29, 1948. There were to be only four voting members: General Muir S. Fairchild, General Joseph McNarney, Lieutenant General Howard Craig, and Lieutenant General Lauris Norstad. General Fairchild became ill, so General McNarney chaired the meeting (*Testimony*, 1949a, p. 83).

Their star witness was the new SAC commander, General LeMay. At the meeting he asked for

the ability to restructure his force, canceling some aircraft orders to fund others. First on his shopping list: 39 more B-

“ ‘Pay as you go’ meant one thing for the Air Force: there would be no growth to 70 combat groups as planned....”

36s, some as bombers and some as reconnaissance variants. They would cost about \$270 million, and that money had to come from cancellations.

In Mr. Northrop’s PBS interview, the viewer gets the clear impression that Northrop was singled out in the cancellation of the Flying Wings. But that is simply false. To raise the \$269,761,000 General LeMay asked for, the Board canceled six separate weapon systems from four corporations. Not only was Northrop not



singled out, it was not even the most severely damaged (see Table 1) (*Testimony*, 1949b, p. 455).⁴

A telegram from Air Materiel Command on January 11, 1949, formally told Northrop the bad news: “the contractor is directed to stop all work authorized... with the exception of the engineering, fabrication, and flight test applicable to the YRB-49A airplane” (Air Materiel Command, 1949).

The last part of the telegram is significant: For 50 years, Mr. Northrop’s followers have claimed that each and every Flying Wing was ordered destroyed by the government, as a sort of ultimate punishment, and this was repeated in the PBS broadcast. But it was never true: Although the B-35s were finally disassembled after Northrop and the Air Force could not agree on storage fees, the surviving YB-49, and the YRB-49 as well, were spared. The YB-49 was the one later destroyed in the taxi accident. The YRB-49, the six-jet reconnaissance plane, did not fly until

May 4, 1950, more than a year after the cancellation. It later was flown to Ontario, California, where it languished in outside storage until 1953, when a crew from Norton Air Force Base cut it up for scrap. Only then was the last of Mr. Northrop’s large Flying Wings gone (Maloney, 1980, p. 30).

THE AIR FORCE PERSPECTIVE

We have seen Mr. Northrop’s allegations that a corrupt decision by the Secretary of the Air Force caused the death of his beloved Wings. Subsequent to his charges, the author interviewed all the surviving Air Force leaders involved in the decision. Their words deserve to be heard.

Stuart Symington went on to become a U.S. senator for 24 years. Contrary to the claims made in the PBS interview, he was never contacted before the show aired (S. Symington, personal communication,

Table 1. Cancellations of Weapons Systems by the Senior Officers Board in 1949

Manufacturer	Aircraft	Quantity Canceled	Amount Of Cancellation
North American	B-45	51	\$105,300,000
North American	F-93	118	\$57,930,000
Northrop	RB-49	30	\$88,500,000
Northrop	C-125	30	\$8,940,000
Kellett	H-10	10	\$6,831,000
Convair	YT-32	1	\$2,260,000
Total			\$269,761,000



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November 17, 1982; S. Symington, personal communication to Col. Walter Boyne, acting director of the National Air and Space Museum, November 4, 1982). In fact, he did not even know of Mr. Northrop's claims until this author contacted him for comment in late 1982. What Senator Symington did know, though, is that all the honors and awards he regularly received in his later years had suddenly ceased, at the same time the PBS interview aired on December 4, 1980.

Interviewed by the author in 1982, Senator Symington clearly recalled discussing the Flying Wing with Mr. Northrop, but was not sure where or when the conversation took place. But given the budgetary climate of the postwar years, the senator said that a merger might very well have been discussed:

The Air Force Chief [General Vandenberg, Chief of Staff] wanted the B-36 and it was up to me to get it. Now you know, of course, that there was a tremendous amount of overcapacity in the industry following World War II. It was clear that many of the smaller companies would not survive. Northrop came to see me, and said that unless he received his Flying Wing orders, his company would be in serious trouble. I knew at the time that the Air Force favored the B-36, built by Convair. I may very well have suggested that he merge his company with Convair, who we knew was going to get business. I may have suggested he go see Dutch Kindleberger at North American, or Bill Allen at Boeing. What I'm

saying is this: I may very well have suggested Northrop talk with Convair about a merger. I'm quite certain, though, that I never would have discussed such a merger with Floyd Odum [head of Convair's parent corporation]. (S. Symington, personal communication, November 17, 1982; S. Symington, personal communication to Col. W. Boyne, acting director of the National Air and Space Museum, November 4, 1982)

In a later interview, Senator Symington called "preposterous and absurd" the notion that he would threaten a firm, especially in an open meeting, with others present:

If there's one thing I learned in all my years in government, it's that it's impossible to keep a secret. You've got twenty people working for you, and they each go home and tell twenty people, and pretty soon it's all over town. It may take a while, but you can't keep a thing like that a secret. (S. Symington, personal communication, November 17, 1982)

Further, Senator Symington claimed that aircraft requirements were determined by the military leadership, and not the civilian side:

Not once, as Assistant Secretary of War for Air, or later as Secretary of the Air Force, did I ever cancel an aircraft that had been recommended to me by the Air



Force. If any recommendation to purchase the Flying Wing had reached my desk, I would have approved it. None did. (S. Symington, personal communication, November 17, 1982; S. Symington, personal communication to Col. W. Boyne, acting director of the National Air and Space Museum, November 4, 1982)

This view was supported by General Lauris Norstad, who was in 1983 the only surviving member of the Senior Officers Board. His statements to the author supported Mr. Symington completely:

Mr. Symington never pressured me or any senior officers of the Air Force. It was my position to make recommendations and I did. Generally, he accepted my recommendations. Sometimes he asked for more information. But never, never did he suggest we change our requirements, or go with a different airplane, or a different company. All of this was in my bailiwick, because my job was to develop requirements, and the B-36 was the only airplane, then or for the foreseeable future, that could meet the requirements. (Gen. L. Norstad, personal communication, January 31, 1983)

Further, General Norstad confirmed the bottom-up nature of the procurement process. Speaking about Mr. Symington:

In no way did he ever generate requirements. Those came from me, and they came to me from the using commands. (Gen. L. Norstad, personal communication, January 31, 1983)

The next place to look, then, was the using command, in this case in the person of General LeMay. Interviewed in his home in 1982, General LeMay denied ever receiving pressure, from Mr. Symington or anyone else, regarding the Northrop Wings or the competing B-36:

No, I got no pressure on any particular airplane. Wouldn't have paid any attention to it anyway.... I don't remember ever having any choice in the matter. The B-36 was it, and what we were pushing. I don't think [the Flying Wings] were even in the running.... [The B-36] wasn't the best airplane in the world, no. We did have a lot of troubles with it, trouble with the gunnery system, trouble with the engines, exhaust stacks kept burning out on it, but we were able to keep it in the air.... We finally hung some more jet engines on the airplane, got more altitude out of it, better performance... so that during its life it furnished us with a weapon system that would have done the job at the time. (Gen. C. E. LeMay, personal communication, September 29, 1982)



**THE CHARACTER OF
THE CHARACTERS INVOLVED**

In the PBS show that aired the statements of Mr. Northrop and Mr. Millar, they appear to speak sincerely about the meeting with Mr. Symington, the threat they said he made, the protestations by General McNarney (“You don’t mean that the way it sounds,”) and Symington’s response (“You’re damned right I do.”)

If one assumes that Mr. Northrop and Mr. Millar were telling the truth as they best recalled it three decades later, then an alternative interpretation arises. Is it possible that Mr. Symington did urge a merger, and that Mr. Northrop resisted? Is it possible that Mr. Northrop, faced with losing his dream to a competitor, asked, “What if I don’t merge?” Is it then possible that Mr. Symington — aware of the Air Force’s desire to keep Fort Worth open — might have said, “You’ll be damned sorry if you don’t.” Then General McNarney’s statement (“You don’t mean that the way it sounds.”) takes on a whole new cast, in effect, “Mr. Secretary, what you *mean* is not what these two men, Northrop and Millar, just now think they *heard*.”

If Mr. Northrop and Mr. Millar were correct in their charges, then the Air Force Secretary was corrupt, and the Commander of Air Materiel Command was at the very least complicit in that corruption. But every source interviewed for this research rejects this possibility.

Not one person interviewed for this article had anything but the highest praise for General McNarney. In a 1983 interview General Elwood P. Quesada, Air Force pioneer and former head of the Federal Aviation Administration, said:

Joe McNarney was the straightest of the straight arrows, a real gentleman. If the world were fair, he would have been Air Force Chief of Staff, and he should have been. But he’d been shunted into staff jobs instead of command positions in World War II. (Gen. E. P. Quesada, personal communication, April 7, 1983)

General Norstad, of the Senior Officers Board, bristled at the author for even daring to ask about General McNarney’s character, and expressed absolute faith in McNarney: “I knew him well. There was never a better disciplined officer, a more straight-laced officer than Joe McNarney” (Gen. L. Norstad, personal communication, January 31, 1983).

Mr. Thomas V. Jones, longtime aerospace leader and past chairman of the Northrop Corporation, in 1983 expressed similar sentiments about the integrity of Senator Symington. But the 1949 cancellation was long before Mr. Jones’ involvement:

This was in the past, and none of us now involved in the corporation were there.... I have no direct knowledge, nor do any of our people have any knowledge, of what caused the cancellation.

I have been a friend, a close friend, of Stu Symington for a long time. Stu’s record stands on its own. He has always been upstanding and fair in his dealings with us, and I have no reason to believe he wasn’t upstanding and fair in this [the Flying Wing] case.



I would serve as a character witness for him any day, but as far as the specifics of [the cancellation] are concerned, I can give no testimony. Or rather, I guess you'd say my testimony would be inadmissible. I have spent a lot of time thinking how I could do something to ease the hurt that this thing has caused Stu, but I really don't know what I can do. (T. V. Jones, personal communication, November 4, 1983)

General Quesada had this to say:

I've known Senator Symington a long while, and I know of a number of occasions where he, like others, could have enriched himself at the public expense. He never did, never even was interested.

At the same time, though, it would be completely in character for him to blow his top and yell at somebody, even something like the "You'll be damned sorry if you don't" remark. He's got something of a temper, you know. (Gen. E. P. Quesada, personal communication, April 7, 1983)

General Norstad's position was similar: In his opinion, the charge of Mr. Northrop and Mr. Millar had

utterly no basis and I'd swear it was incorrect.... There was no skullduggery involved. I know all the cast of characters, and it's

inconceivable. (Gen. L. Norstad, personal communication, January 31, 1983)

It is fitting that the final words on this come from General LeMay. The relationship between him and Mr. Symington was complex. During this research, it became clear that the former Air Force Secretary had the deepest affection and respect for General LeMay, and he claimed to have successfully interceded with President Kennedy to facilitate General LeMay's selection as Air Force Chief of Staff. But the general had a deep and abiding mistrust of politicians, and his feelings about Secretary Symington were no different. Still, he rejected Mr. Northrop's allegation:

Well, I'm kind of a pessimistic guy: All these politicians have a lower order of moral value than I think they should have, but I don't think this would have been tried by anyone.

I don't believe any of it. Mr. Northrop, maybe he did believe it, but I don't think anybody gets mad at any particular company that's got something to sell to the armed services. You may not like what they sell, and you don't buy it, but to go and be vindictive about it after you've refused their product, no. You've too many other things to do to start fiddling around with that. You've got too much to think about with the successful guy, to make sure he gets out a product that meets your expectations.



Clipped Wings: The Death of Jack Northrop's Flying Wing Bombers

Photo courtesy of Northrop Grumman Corporation



A YB-49 in flight: While the Flying Wing bombers are now gone, they paved the way for the future of airpower.

There may have been hard feelings between Northrop and Symington. I could understand that. Symington wasn't the most likable guy in the world. (Gen. C. E. LeMay, personal communication, September 29, 1982)

IN CLOSING

The research for this article began with a simple hypothesis: that the development of American aviation was dealt a severe blow by the cancellation of the Flying Wings a half century ago, and that the cause of that blow was political, not technical.

Through several years of research, that hypothesis was disproved. Regardless of

the sincerity of Mr. Northrop's recollections, the truth — as revealed by once-classified documents, Air Force records, and the unanimous views of Air Force leadership — is that the cancellation of the Flying Wings was a prudent decision, based on technical shortcomings, budgetary limitations, and strategic requirements.

Fifty years later, most of the participants in this drama are gone. Mr. Northrop's Wings are again airborne, in the form of the B-2 Stealth Bomber. And in the B-2, history has again repeated itself, in programmatic issues caused by Northrop's limited production capacity, in defense acquisition cutbacks caused by a changing world situation, and in the resulting cuts in B-2 procurement. But those are other stories, for another day.



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ENDNOTES

1. Mr. Northrop was incorrect here. The “military chief of the Air Force” would have been Air Force Chief of Staff General Hoyt S. Vandenberg. General Joseph McNarney was Commander of Air Materiel Command, charged with acquisition and logistics support of Air Force weapons systems.
2. The memo noted that many of the same problems plaguing the XB-35 would also affect the YB-49.
3. The position at the time of Lt. Col. Collins, who made this statement, is not clear, nor is it clear which pilot was reluctant to do the stalls.
4. Although North American was the biggest loser in the January 1949 cancellations, months later Boeing was hit even harder: to purchase another batch of B-36s, the Senior Officers Board canceled \$179,937,000 worth of contracts for Boeing B-54s/RB-54s. See *Testimony*, 1949b, p. 456.



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